

7. Contingency plan information;

- ◆ Ground improvement plans when required at portals and/or behind thrust block/reaction wall due to weak and unstable soil conditions.
- ◆ Obstruction removal through emergency (911) shafts or other means.
- ◆ Mechanical breakdowns and recovery of the MTBM through 911 shafts or other means.
- ◆ Control of hydrofracture and slurry loss.
- ◆ Remediation of loss of ground and excessive ground surface settlement.

623.4 PIPE RAMMING

Pipe Ramming pit requirements are identical to those for Bore & Jack.

Establishment of a survey-grid line is required.

Before any project begins, exploration bore-holes and a complete geotechnical investigation shall be conducted to determine possible difficulties in order to determine the drilling trajectory.

The casing shall be rammed open ended, except when the diameter is 6" or smaller. Pipes 6" or smaller may be rammed open ended or closed.

A soil shoe may be installed on the leading edge of the casing, either by fabrication on site or obtained from the manufacturer. A soil shoe shall not be utilized on those installations at depths or 18" or less from the surface.

Lubrication shall only be utilized to reduce friction and increase production. The amount of lubrication directed to the outside of the pipe shall only be of a sufficient amount required to fill the void between the outside of the pipe and soil, as created by the soil shoe.

Lubrication to the inside of the casing shall only be an amount adequate to assist in spoil removal when the ram is completed.

Welding of the casing at joints shall be as per the manufacturer's recommendations.

The use of straps at each joint on pipe diameters of 12" or larger is required as is the use of the manufacturer's specified welding wire or rod.

Spoil removal for rammed encasements of 30" in diameter or less, may utilize pressurized air or water.

Air pressure shall not exceed 150 psi and water pressure shall not exceed 300 psi.

Encasements larger than 30" in diameter shall have the spoils removed by other means than by pressurizing of the pipe, such as, manual, auguring, vacuum, washing or other means.

The Receiving Pit shall be steel plated entirely when the spoils are to be removed from within the encasement by means of air or water pressurized methods.

623.5 PIPE BURSTING

Pipe Bursting operations generally are only performed by the owning utility when they have exceeded the operating capacity of their existing facilities. In most cases pipe bursting allows the utility owners the advantage of upgrading their existing facilities by up to 50%.

On installations of diameters 12" or greater it is necessary to establish a survey-grid line and establish the existing elevation points over the existing area of installation.

A soil analysis should be required and review of the information to identify any locations of difficulty, density, water table, changes in soil formation that could present or create greater friction resistance.

Request information of the proposed project as to:

1. the ratio of the proposed upgrade to determine difficulty, generally up to 25% increase in diameter is common. An increase of 25% - 50% is considered challenging, and an increase of 50% or greater is considered experimental.
2. the existing depth of cover, "rule of thumb" depth of cover should be at least 10X the difference in the upgrade of the existing diameter to be burst.
3. whether or not the existing line has been viewed by video, do not allow line to be burst blind.
4. is this proposed line straight or are there bends in the line.
5. if bends are existing in the line, the location of the bend will have to be excavated and new pits re-established at those locations.
6. require that the contractor provide a list of equipment to be on site to handle an emergency, in the event that bypass pumping is required to maintain the existing service in the event of a problem.
7. as to what method will be utilized (static, pneumatic, burst and jack, or hydraulic).

624 OPEN-CUT ROAD
Permit Code UT

Encroachment Permit policy dictates that underground installations and crossings within State highway right-of-way shall be performed by methods of trenchless technologies, either Bore & Jack, HDD, Micro-Tunneling, Pipe Bursting or Pipe Ramming, unless specified otherwise by permit. Open trenching is authorized only when the applicant demonstrates that all alternatives have been investigated and that installation by a trenchless technology is not feasible. Procedures that shall be followed in evaluating applications for open trenching are shown in Table 6.10.

The Reclamation Board, in maintaining the integrity of the State's levee system, issues permits for construction of facilities within the levee prism. Caltrans and the Reclamation Board cooperatively have developed procedures for controlling installation of underground facilities where a State highway is on or crosses a levee. The Board prefers open cut highway crossings to ensure the integrity of the levee. Caltrans issues permits that conform to Board requirements.

Authorized open trenching must be noted clearly in the encroachment permit or permit rider. Traffic controls must conform to State standards and recommendations of Highway Operations or Permits. Unless otherwise specified in the permit, work must be accomplished one lane-width at a time on conventional two-lane highways. If determined acceptable, two lanes of a multi-lane highway may be used for the work when one full lane width in each direction is available for traffic. Trenching, backfilling, and paving operations shall conform to Caltrans' standards.

Transverse trenching is not authorized on freeways or expressways without headquarters approval as an exemption to policy.

624.1 Backfill of Excavations and Trenches

Backfilling of excavations and trenches shall comply with Caltrans Standard Specifications. The specification for Controlled Low Strength Material (CLSM) is shown in Appendix H.